

Lightning Student Activity Book

I. Introduction

Lightning kills hundreds of people around the world each year. It is estimated that lightning strikes the Earth about 100 times every second. Lightning starts wildfires, destroys computers, fries the wiring in phones, and upsets AM radio reception.

Get Info Objectives

1. Explain the causes of lightning and thunder.
2. Describe lightning damage.
3. Describe the most safe and least safe places to be during a thunderstorm.

Gather Data Objectives

1. Draw the types of lightning.
2. Determine the place and time that lightning strikes most often in the United States.
3. Explain first aid for someone struck by lightning.

Application Objectives

1. Calculate the distance from a strike using the "flash to bang" rule.
2. Calculate the speed of sound in feet per second.
3. Calculate the speed of sound in meters per second.

II. Get Info

A. Lightning Occurrence and Formation

- Click on the "Questions and Answers about Lightning" site.
- Read sections one and two. Answer the following questions.

1. What causes lightning?

2. What conditions are most favorable for lightning formation?

- Read section five. Answer the questions below.

3. What kinds of damage can lightning cause?



4. Where are the most dangerous places to be during a thunderstorm?

- Click the "Back" button at the top of the screen in your web browser until you get back to the OAR Lightning site.
- Click on the "Characteristics of a Storm" site.
- Read the thunder section. Answer the questions below.

5. Explain, in your own words, how thunder forms.

- Click "Back" until you get back to the OAR Lightning Activity.



III. Gather Data

A. Types of Lightning

- Click on the "Types of Lightning" site.
- Read the types of lightning section.

1. Draw and label the three major types of lightning.



- Click "Back" until you get back to the OAR Lightning Activity.

B. Frequency of Strikes

- Click on the "Frequency of Strikes" site.
- Scroll down to page 2. Look at the colored image.

1. What areas of the continental United States have the most lightning strikes per year?

- Click "Back" until you get back to the OAR Lightning Activity.

C. Time of Strikes



- Click on the "Temporal Severe Report Distribution" site.



1. During what six-hour period does most severe weather occur?



- Click "Back" until you get back to the OAR Lightning Activity.

D. Safety



- Click on the "Questions and Answers about Lightning" site.
- Read section 6.



1. What does "flash to bang" mean?

2. During what phases of a thunderstorm are the most people killed by lightning?

3. Where is the safest place to be during a thunderstorm?

- Click "Back" until you get back to the OAR Lightning Activity.

E. Lightning Injuries and Damage

- Click on the "Lightning Social and Economic Costs" site.
- Scroll down to table 2.

1. What organic (physical) problems do lightning strike survivors have?

- Click "Back" until you get back to the OAR Lightning Activity.
- Click on the "First Aid" site.
- Scroll down to the first aid section.



2. What first aid should you do for someone who has been struck by lightning?

- Click "Back" until you get back to the OAR Lightning Activity.
- Click on the "Lightning Damage" site.

3. What kinds of damage are done by lightning?

- Click "Back" until you get back to the OAR Lightning Activity.





F. Common "Knowledge"

- Click the "Lightning Myths" site.

1. Will wearing rubber shoes help keep you safe?

2. Why is a car a fairly safe place to be during a thunderstorm?

3. What types of structures get struck by lightning most often?

4. Should you always stay away from trees?

- Click "Back" until you get back to the OAR Lightning Activity.



IV. Application

A. Explain Lightning Fatalities

1. Hypothesize why most lightning fatalities occur at the beginning or end of a thunderstorm, rather than during the part of the storm with the heaviest rain.

B. Math Applications

1. If a lightning flash is seen 12 seconds before the thunder is heard, about how far away did the lightning strike?

_____ miles




2. There are 5,280 feet per mile. Use the "flash to bang" rule to figure out the speed of sound in feet per second.

3. There are 2.54 centimeters per inch, 12 inches per foot, and 100 centimeters per meter. Convert your answer in number two to meters per second.

V. Enrichment Activities

A. RESEARCH

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1. Research Saint Elmo's Fire. What kind of lightning is St. Elmo's Fire? Where does it occur? What problems does it cause?
 2. Research "Faraday Cage".
 3. Research Zeus' thunderbolts made by Vulcan.
 4. Research Nikoli Tesla.
 5. Find out how buildings can be protected from lightning strikes.

B. Interviews

1. Interview a meteorologist about lightning. Find out what equipment and technology is used to predict and track lightning.
2. Interview an electrician. Find out what "grounded" outlets are and how they work.
3. Interview a firefighter about what lightning can do to a forest and how they put out the fires.
4. Interview a forester about controlled burning. What is it and how is it used?

C. Related Web Sites

1. Lightning Safety
<http://www.lightningsafety.com>
2. Kid's Lightning Information and Safety Page
<http://www.azstarnet.com/anubis/zaphome.htm>
3. The Lightning Dictionary
<http://wvit.wvnet.edu/~djrobi/glossary.html>
4. National Weather Service Lightning page
<http://www.nws.noaa.gov/om/trwbro.htm>